SONY

STEREO TURNTABLE SYSTEM

PS-X600

OPERATING INSTRUCTIONS Page 2

Before operating the unit, please read this manual thoroughly.
This manual should be retained for future reference.

MODE D'EMPLOI page 13

Avant toute opération, lire attentivement ce mode d'emploi.
Conserver ce manuel pour toute référence ultérieure.

BEDIENUNGSANLEITUNG Seite 24

Vor Inbetriebnahme lesen Sie bitte diese Bedienungsanleitung aufmerksam durch.
Bewahren Sie diese Anleitung zum späteren Nachschlagen gut auf.

MANUAL DE INSTRUCCIONES Página 35

Antes de manipular el aparato, lea este manual detenidamente.
Consérvelo para futuras referencias.

English

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

TABLE OF CONTENTS

Features 2
Operating voltage 3
Precautions 3
Location and function of controls 4
Turntable assembly 5
  Cartridge installation
Tonearm adjustment 6
Record playing 7
  To begin record play at a particular point
  To move to a different part of a record while the record is playing
  To stop during play
  To lift up the stylus during play
  To repeat play
Tonearm drop-point adjustment 8
How the auto record size selection works 9
Instantaneous start of play (cueing) 9
Synchronized play of the turntable and the cassette deck 10
Maintenance 11
Specifications 11
Trouble checks 12

FEATURES

Biotracer electronic tonearm
The horizontal and vertical movement of the tonearm is monitored by the Biotracer's own sensors, and this information is transmitted to the tonearm by the tonearm's own linear motors to suppress resonance at low frequencies and to obtain the maximum signal-to-noise ratio. With the microprocessor incorporated, the tonearm movement, up/down or forward/backward, is accurate and smooth.

Auto record size selection
Record size is automatically set by a photo sensor system.
If no record is on the turntable, the tonearm will not descend but will automatically return to the arm rest.

Electronic stylus force and anti-skating adjustment
As the stylus force is electronically controlled by a knob it can be easily adjusted during record play. The proper anti-skating force is automatically set when the stylus force is set.

Synchronized operation with the Sony cassette decks
When the tonearm lowers to the lead-in groove of a record, the cassette deck stand-by mode is released and the record mode assumed.
When play finishes, the cassette deck is automatically set first in the record muting mode, then in the pause mode. This synchronized operation is possible with Sony cassette decks equipped with a four-pin remote control jack which is connected with a Sony RM-65 synchro remote control unit.

Muting system
The muting system activates when the tonearm is lifted and deactivates after the tonearm lowers onto a record. There is no need to turn down the amplifier volume every time a stylus is placed on a record or when a cartridge is changed.

Quartz lock and magnedisc servo system
The turntable maintains an accurate and drift-free speed by referring to a frequency generated by a very stable quartz oscillator, and with aid of a speed monitoring system which utilizes a magnetic pick-up head and a pulse signal derived from a magnetic coating at the edge of the platter.

Linear BSL motor
Direct drive system with Sony's unique BSL (Brushless and slotless) motor which has a high signal-to-noise ratio to virtually eliminate wow and flutter. Its high torque assures quick start to 33⅓ rpm after only a half revolution.

OPERATING VOLTAGE

Before connecting the unit to the power source, check that the operating voltage of your unit is the same as the local power line voltage.
The model for European countries (Type 1) operates on 220 V ac.
The model for the United Kingdom (Type 2) operates on 240 V ac.
The model for other countries (Type 3) operates on either 110-120 or 220-240 V ac. The voltage selector is located on the rear panel. If the selector must be reset, disconnect the ac power cord and slide the selector to the desired voltage.

For the Customers in the United Kingdom

Important
The wires in the mains lead are coloured in accordance with the following code :

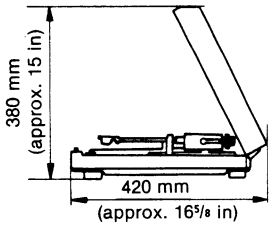
Blue : Neutral
Brown : Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows :
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

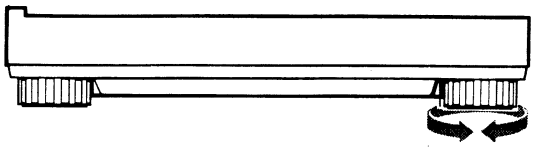
PRECAUTIONS

On safety
- Before operating the unit, be sure that the operating voltage of your unit is identical with that of your local power supply.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by the plug. Never pull the cord itself.

On installation
- Place the turntable on a level surface.
- Avoid placing the unit near electrical appliances (such as a television, hair dryer, or fluorescent lamp) which may cause hum or noise.
- Place the turntable where it will not be subject to any vibration, such as from speakers, slamming of doors, etc.
- Keep the unit away from direct sunlight, extremes of temperature, and excessive dust and moisture.
- Allow at least 10 cm (4 inches) clearance behind the unit so that the cover can be opened.

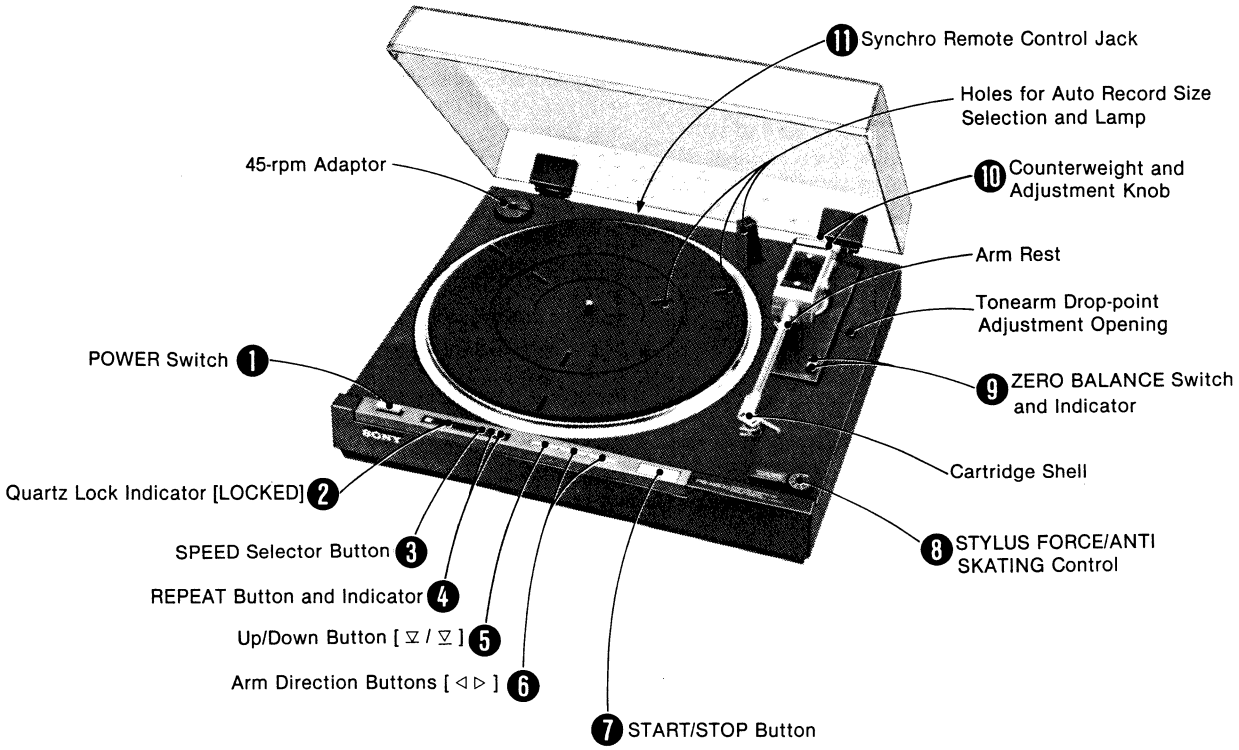


- The turntable has resilient feet that isolate the mechanism from external shock and vibration. If the unit has not been placed on a level surface, turn the feet to level the unit.



On repacking
Do not throw away the carton and packing materials. It is an ideal container in which to transport the unit. When shipping the unit to another location, repack it as illustrated on the carton box observing the following points.
- Secure the tonearm to the arm rest.
- Fix the transit screws in the original positions.

LOCATION AND FUNCTION OF CONTROLS


⓫ Synchro Remote Control Jack
Holes for Auto Record Size Selection and Lamp
45-rpm Adaptor
⓾ Counterweight and Adjustment Knob
Arm Rest
Tonearm Drop-point Adjustment Opening
POWER Switch ❶
⓽ ZERO BALANCE Switch and Indicator
Cartridge Shell
Quartz Lock Indicator [LOCKED] ❷
SPEED Selector Button ❸
❽ STYLUS FORCE/ANTI SKATING Control
REPEAT Button and Indicator ❹
Up/Down Button [▽ / ▽] ❺
Arm Direction Buttons [◁ ▷] ❻
❼ START/STOP Button

❶ POWER Switch
Press to turn on the turntable. To turn the turntable off, press it again.

❷ Quartz Lock Indicator [LOCKED]
The indicator illuminates when the turntable rotation is locked with the nominal speed by the quartz lock control system.

❸ SPEED Selector Button
Selects the record speed. When the POWER switch is turned on, the speed is always 33⅓ rpm unless the button is pressed to select 45 rpm.

❹ REPEAT Button and Indicator
Press this button to repeat play. The indicator illuminates and repeat play continues until this button is pressed to stop it. If the START/STOP button is pressed during repeat play, the tonearm returns to the arm rest and the turntable stops rotating.

❺ Up/Down Button [▽/▽]
Press this button to lift or lower the tonearm during play.

❻ Arm Direction Buttons [◁▷]
To move the tonearm inward, press the ◁ button, and to move outward, the ▷ button. The tonearm is raised and continues to move while the button is pressed. The tonearm will stop when the button is released. For fine adjustment of the tonearm drop-point over a record, press and immediately release the appropriate button.

❼ START/STOP Button
Press this button for record play. To stop during play, press this button again.

❽ STYLUS FORCE/ANTI SKATING Control
Stylus force and anti-skating force are both electronically set by this knob. The stylus force can be changed during record play if so desired.

❾ ZERO BALANCE Switch and Indicator
Press the switch before adjusting the tonaerm balance.

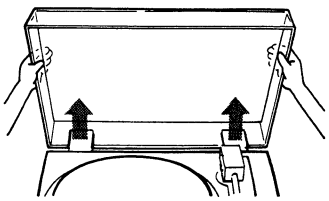
❿ Counterweight and Adjustment Knob
For tonearm balance adjustment, turn the knob to move the counterweight.

⓫ Synchro Remote Control Jack
Synchronized recording from disc to tape is possible on specified Sony cassette decks by using the synchro remote control unit RM-65.

TURNTABLE ASSEMBLY

The numbers in the illustration refer to the sequence of the assembly.

Dust cover removal



Open the dust cover fully and slide it upward.

3 Place the rubber mat on the platter, matching the projection on the back of the rubber mat to the holes on the platter.

Rubber Mat

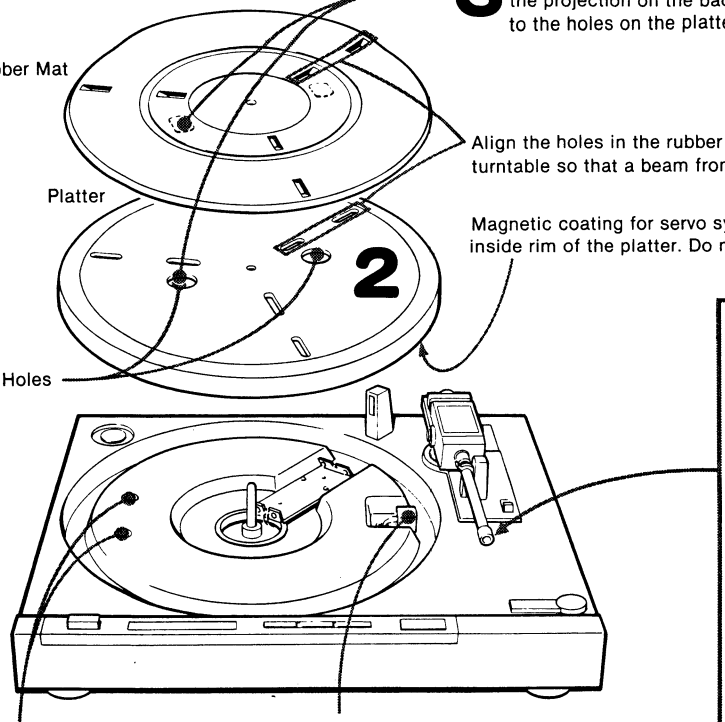
Platter

Holes

Align the holes in the rubber mat and the holes in the turntable so that a beam from the lamp goes through.

Magnetic coating for servo system is applied on the inside rim of the platter. Do not touch the coating.

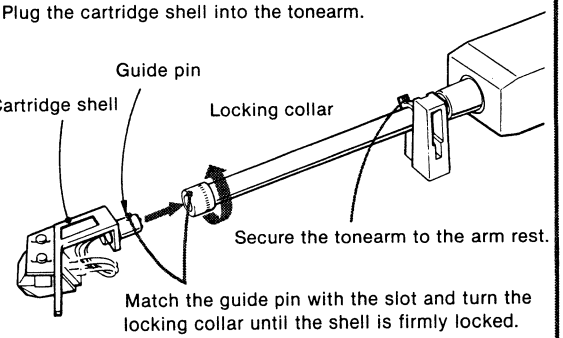
2



Magnetic pick-up head
Do not touch.

1 Remove the transit screws. Save these screws, since they will be required when repacking.

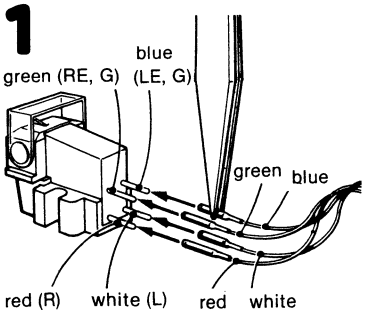
4 Plug the cartridge shell into the tonearm.


Guide pin
Cartridge shell
Locking collar
Secure the tonearm to the arm rest.
Match the guide pin with the slot and turn the locking collar until the shell is firmly locked.

When using a cartridge weighing between 7 and 12 g, insert the supplied extra weight fully to the end.

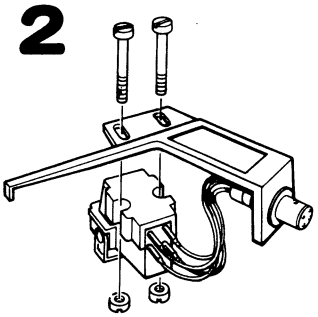
CARTRIDGE INSTALLATION

1



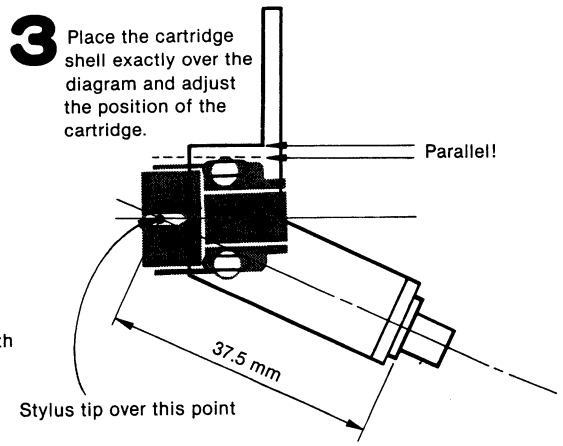
Cartridge pins **Wires**

2

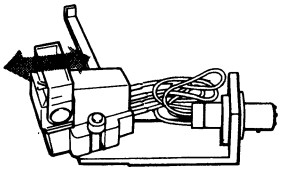


Attach the cartridge loosely with the supplied mounting screws.

3 Place the cartridge shell exactly over the diagram and adjust the position of the cartridge.

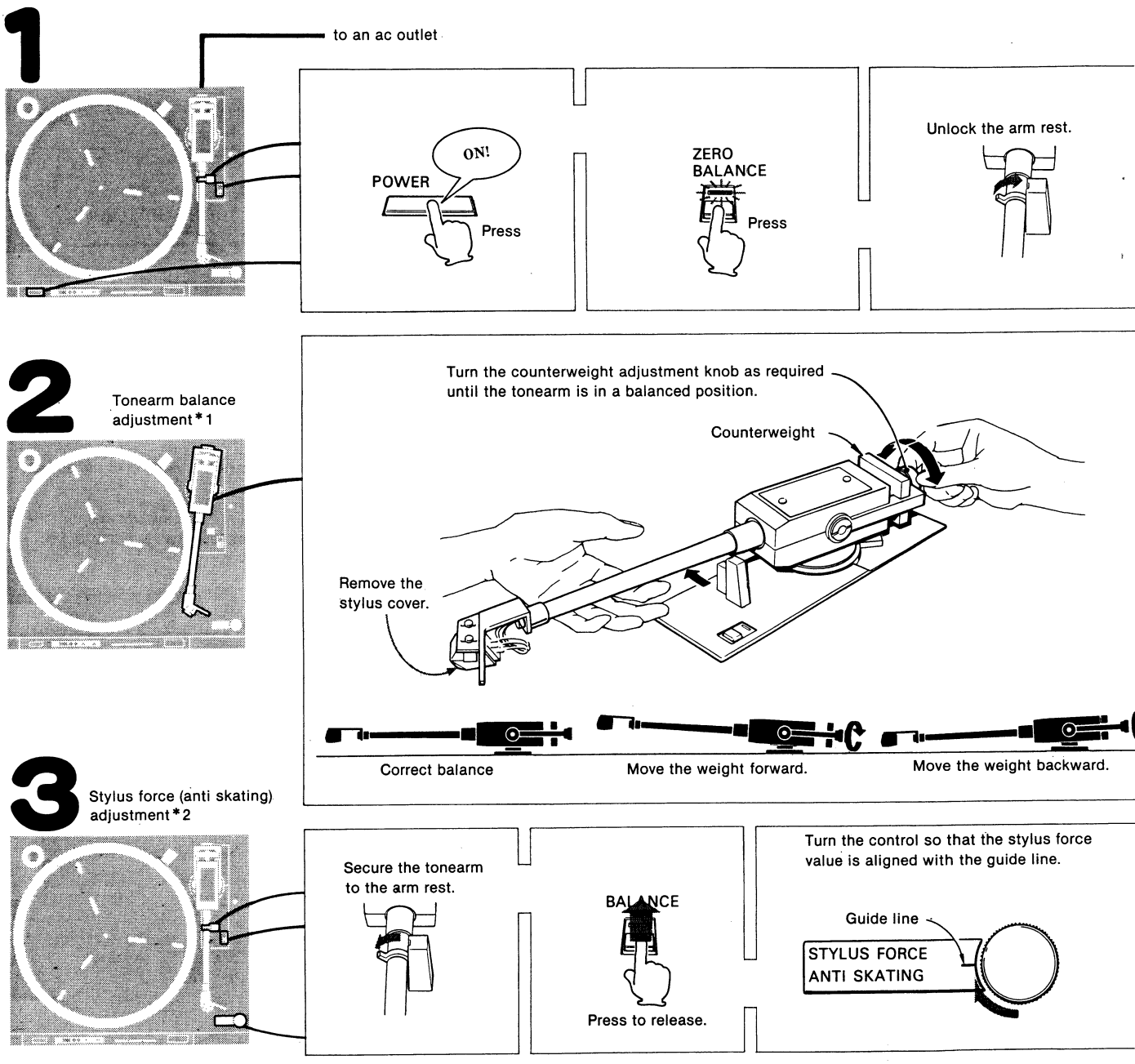


4 Tighten the screws down.
You can check if the cartridge is correctly installed by using the alignment gauge on the back of the rubber mat.
See "Overhang check" on page 8.



TONEARM ADJUSTMENT

The turntable must be on a level surface while the tonearm is being adjusted.
Be careful not to damage the stylus tip while making adjustments.



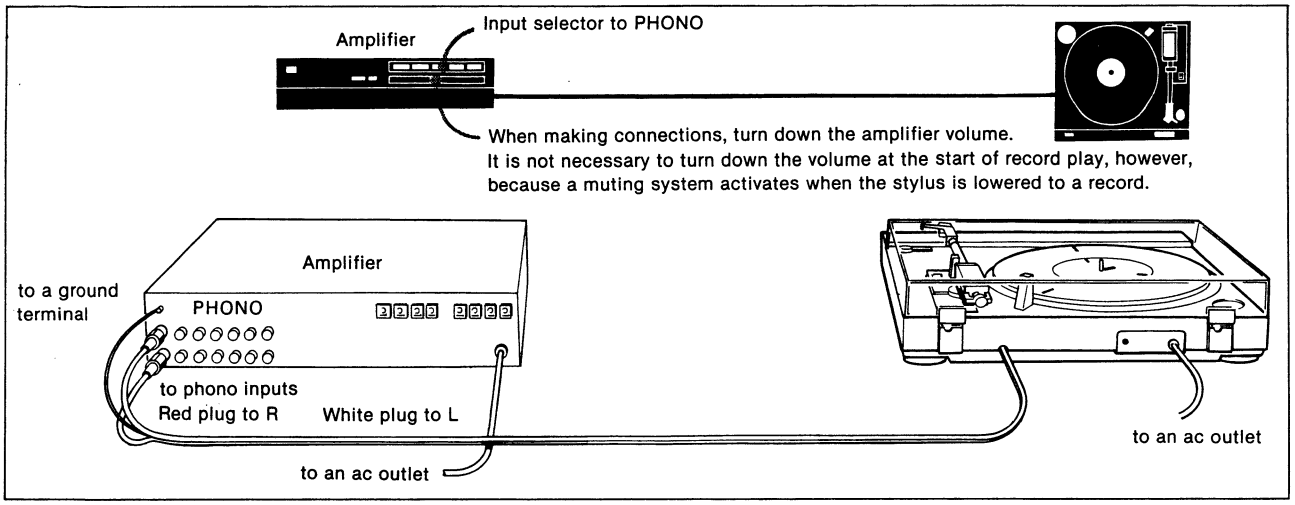
***1 Tonearm balance adjustment**
It is critically important for good sound reproduction that the stylus traces the record groove accurately and with the proper stylus force. To do this, the tonearm must first be balanced so that the proper stylus force can be applied.

***2 Stylus force**
Stylus force is the vertical force applied to the stylus tip so that it can accurately trace a record groove.
The stylus force is applied after the tonearm is balanced.
Since the proper stylus force differs depending on which cartridge is installed, be sure to apply the stylus force recommended for your cartridge. If the stylus force is too light, the stylus will skip grooves. When it is too heavy, the stylus tip and the record will wear excessively. Note that if you play a record at a temperature below 10°C (50°F), or if the record to be played is badly warped, the stylus force should be increased by 20%.

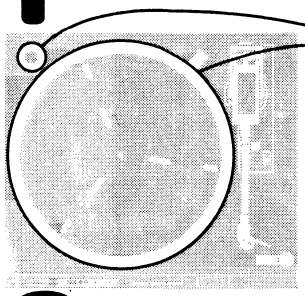
Anti-skating
While the record is being played, friction between the record groove and the stylus produces a force that tends to drive the tonearm toward the center of the record. The anti-skating control cancels this force.

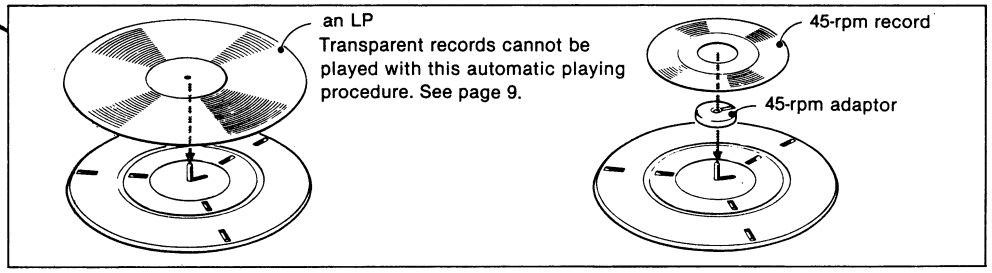
RECORD PLAYING—Auto play

Connection to an amplifier

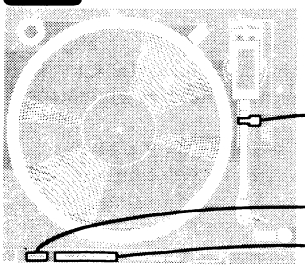

Amplifier
Input selector to PHONO
When making connections, turn down the amplifier volume.
It is not necessary to turn down the volume at the start of record play, however, because a muting system activates when the stylus is lowered to a record.
Amplifier
to a ground terminal
PHONO
to phono inputs
Red plug to R
White plug to L
to an ac outlet
to an ac outlet

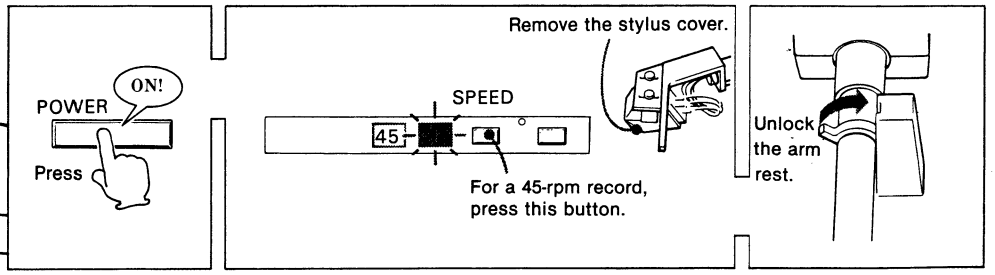
1



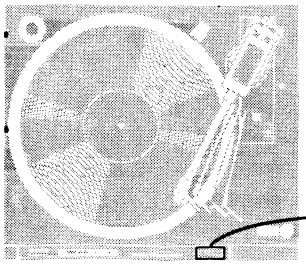

an LP
Transparent records cannot be played with this automatic playing procedure. See page 9.
45-rpm record
45-rpm adaptor

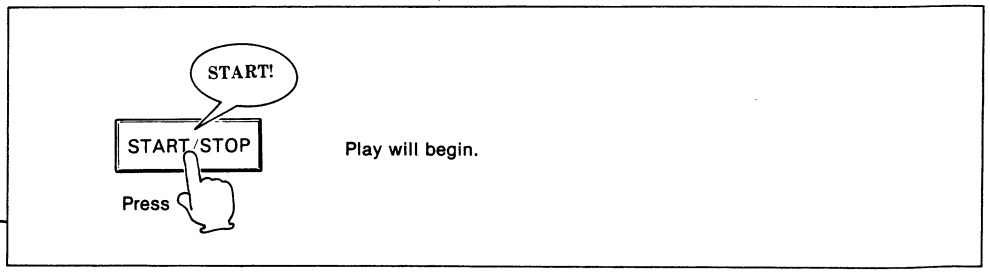
2





3





4

When the tonearm reaches the end of the record,
it will automatically return to the arm rest and the turntable will stop.

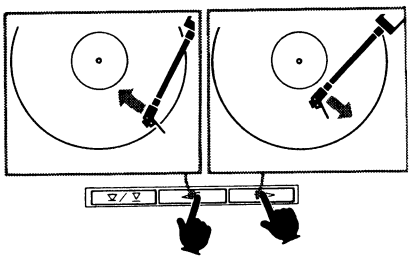
TO BEGIN RECORD PLAY AT A PARTICULAR POINT

❶ Press the POWER switch (ON) and select the correct record speed.

❷ Bring the tonearm to the point over the record at which you want play to begin.

Instead of handling the tonearm, use the ◁ ▷ buttons.

Keep the ◁ button pressed until the tonearm reaches the desired point. Then, to adjust the stylus drop point precisely, press and immediately release the ◁ or ▷ button as necessary.



❸ Press the START/STOP button. The tonearm will lower to the record and play will begin.

TO MOVE TO A DIFFERENT PART OF A RECORD WHILE THE RECORD IS PLAYING

Keep the appropriate ◁ or ▷ button pressed until the tonearm reaches the desired position. For fine movement, press and immediately release the button. To lower the tonearm onto the record, press the ▽/▽ button.

TO STOP DURING PLAY

Press the START/STOP button. The tonearm will return to the arm rest and the turntable will stop rotating.

TO LIFT UP THE STYLUS DURING PLAY

To lift the stylus from a record for a moment and then start playing from the same point, press the ▽/▽ button. To lower the tonearm onto the record, press the button again.

TO REPEAT PLAY

Press the REPEAT button either before or after starting play. The tonearm continues repeat play unless the button is pressed again to turn off the repeat function. To stop during repeat play, press the START/STOP button.

TONEARM DROP-POINT ADJUSTMENT

The tonearm's drop-point during auto play has been adjusted at the factory. If this needs to be readjusted, proceed as follows.

❶ Be sure that the turntable is turned off and the tonearm is secured to the arm rest.

❷ Remove the rubber cap over the tonearm drop-point adjustment opening located at the right side of the arm base.

❸ Insert the supplied adjustment key into the opening

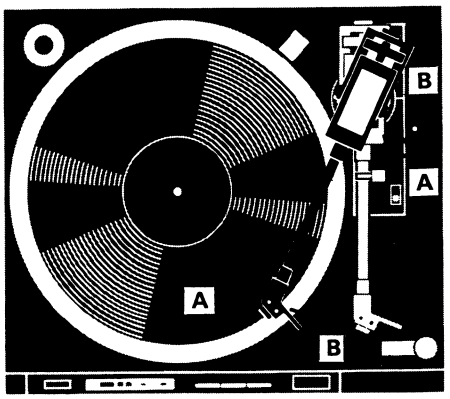
To move the drop-point inward . . . turn the screw in direction A.

To move the drop-point outward . . . turn the screw in direction B.

● Be sure not to turn the screw in direction B so far that the stylus tip cannot make contact with the record.

❹ Start auto play and check that the stylus lowers on the correct drop-point.

● If the drop-point is correct for 30 cm (12 inch) records, it will also be correct for 17 cm (7 inch) records.



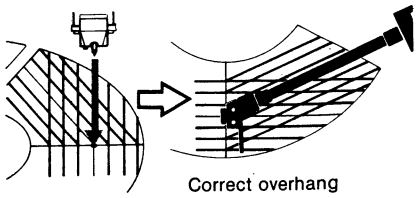
OVERHANG CHECK*

Check that the cartridge is correctly installed, using the alignment gauge on the underside of the rubber mat. If the installation is incorrect, the tonearm drop-point during auto play will be incorrect.

❶ Place the rubber mat upside down, and turn on the power.

❷ Bring the tonearm over the point where the two fine lines cross and carefully lower the stylus to this point by pressing the ▽/▽ button.

❸ Check to see that the head shell is parallel to the lines marked on the rubber mat, as shown in the illustration. If it is not, loosen the cartridge mounting screws and slide the cartridge to the required position. Tighten the screws and recheck the balance and stylus force.



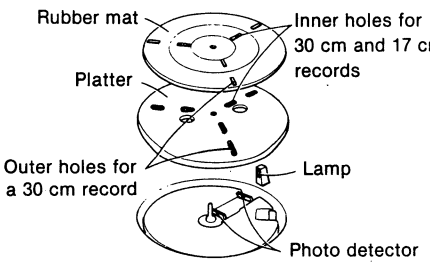
Correct overhang

*** Overhang**

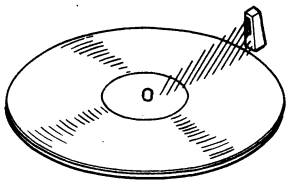
While record grooves are cut by a head which tracks a record's radius in a line, a tonearm, because it is pivoted, traces an arc on a record. To compensate for this difference in movement, the head shell is angled and the cartridge is installed with a 16.5 mm overhang. (See the illustration.) The correct overhang is obtained by installing the cartridge with a 37.5 mm space between the stylus tip and the end of the cartridge shell and by checking the installation with the alignment gauge.

HOW THE AUTO RECORD SIZE SELECTION WORKS

By pressing the START/STOP button, the tonearm goes automatically into the lead-in groove of whether 30 cm or 17 cm. A beam from the lamp is transmitted through the holes provided on the rubber mat and the platter to the photo detector which actives the auto record size selection.

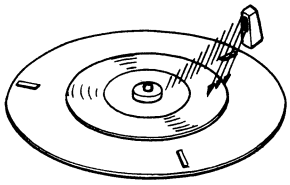


When a 30 cm record is to be played,



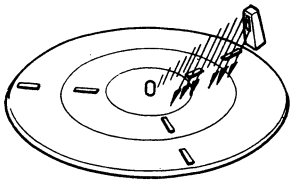
both inner and outer holes are covered so no beam is transmitted to the photo detector.

When a 17 cm record is to be played,



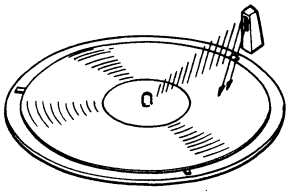
the inner holes are covered so a beam is transmitted through the outer holes to the photo detector.

When there is no record on the platter,



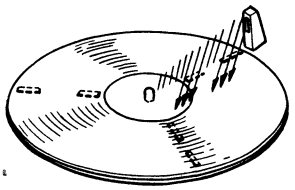
a beam is transmitted through both the inner and outer holes to the photo detector. Even if the START/STOP button is pressed mistakenly, the tonearm does not lower but return to the arm rest.

When a 25 cm record is to be played,



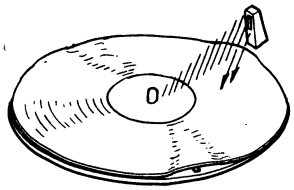
the tonearm lowers to the same point if a 17 cm record were on the platter, since only the inner holes are covered. To play a 25 cm record, lower the tonearm to the lead-in groove by pressing the ▽/▽ button then press the START/STOP button.

When a transparent record is to be played,



a beam passes through both the inner and outer holes to the detector so the tonearm does not lower on a record. To play a transparent record, lower the tonearm to the lead-in groove by pressing the ▽/▽ button and press the START/STOP button.

When a warped record is to be played,

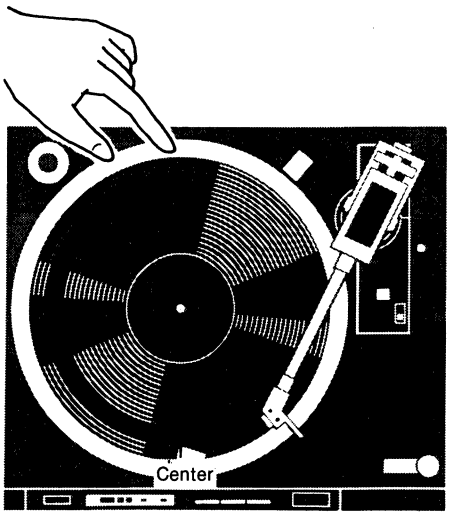


if the record is badly warped, a beam may pass through the holes to the detector and cause malfunction of the auto record size selection.

INSTANTANEOUS START OF PLAY (CUEING)

Owing to the powerful starting torque of the turntable, instantaneous start on a record is possible. For this operation the amplifier volume should be set to a normal listening level.

❶ Press the POWER switch (ON) and select the correct record speed.
❷ Lower the tonearm at the lead-in groove of the desired music by pressing the ▽/▽ button.
❸ Rotate the turntable **slowly** by hand and at the starting groove of the music, it begins to be heard. Reset the stylus at the point just before the starting of the music by rotating the turntable by hand in the opposite direction a little. The starting point is now found.
❹ From the point indicated in the illustration below, rotate the turntable by hand slowly in the opposite direction up to the center position. (The rotation corresponds to the turntable starting torque.)
❺ Press the START/STOP button. The music starts to play instantaneously.



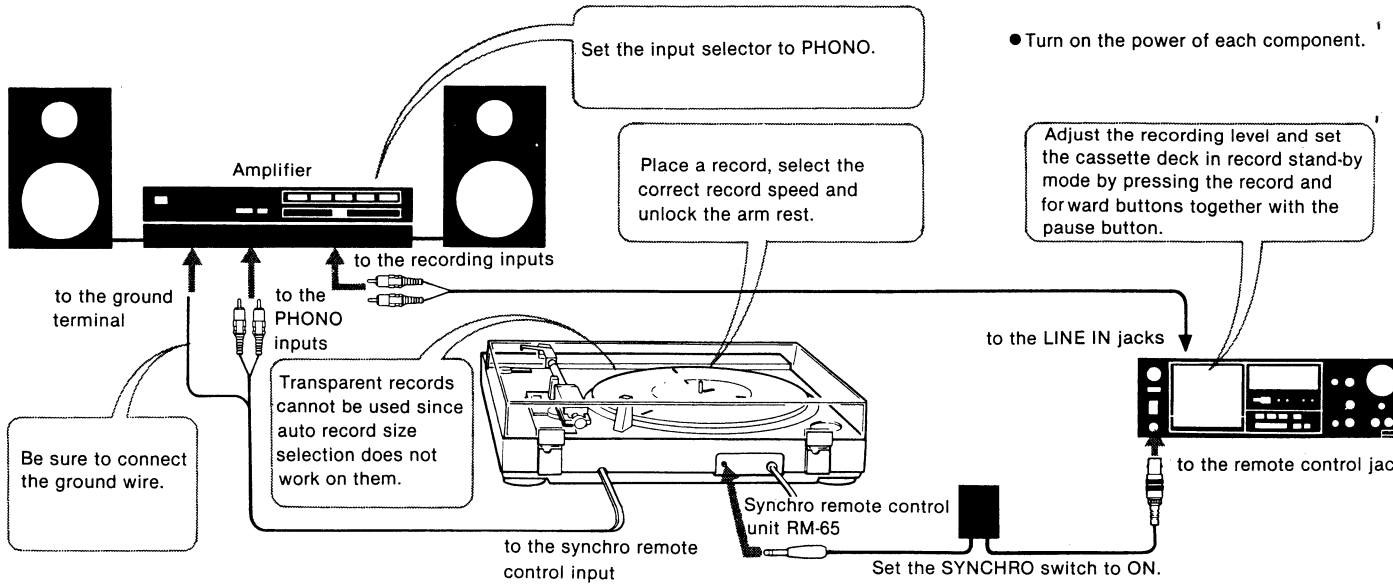
SYNCHRONIZED PLAY OF THE TURNTABLE AND THE CASSETTE DECK

—With an RM-65 synchro remote control unit connected

Record recording starts only when the START/STOP button is pressed. When the tonearm lowers to the record, the tape deck goes into the the record mode and, when the tonearm is lifted up, the deck goes into the auto record muting mode for four seconds, then into the pause mode.

Cassette deck which can be used with your turntable for this special synchronized operation are those Sony models which are equipped with a 4-pin remote control jack.
An RM-65 synchro remote control unit (optional) is required to connect the turntable and the cassette deck.

Connection and preparation

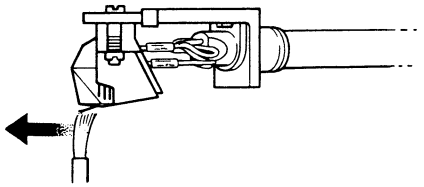

Set the input selector to PHONO.
● Turn on the power of each component.
Amplifier
Place a record, select the correct record speed and unlock the arm rest.
Adjust the recording level and set the cassette deck in record stand-by mode by pressing the record and forward buttons together with the pause button.
to the recording inputs
to the ground terminal
to the PHONO inputs
to the LINE IN jacks
Transparent records cannot be used since auto record size selection does not work on them.
Be sure to connect the ground wire.
to the remote control jac
Synchro remote control unit RM-65
to the synchro remote control input
Set the SYNCHRO switch to ON.

RECORDING

Desired action	Turntable operation	Synchronized operation of the cassette deck
To record form the beginning of a record...	Press the START/STOP button.	When the tonearm lowers to the record, the pause mode is released and recording begins.
To lift up the tonearm to move to a different point on a record...	Press the ▽ / ▽ button.	When the tonearm is lifted up, auto record muting activates for four seconds, then the pause mode is assumed.
To record from a point some way into the record...	Bring the tonearm over the desired point and press the START/STOP button.	When the tonearm lowers to the record, the pause mode is released and recording begins.
To stop recording during record play...	Press the START/STOP button.	When the tonearm is lifted up, auto record muting activates for four seconds, then the pause mode is assumed.
When record play ends...	The tonearm returns automatically to the arm rest.	When the tonearm is lifted up, auto record muting activates for four seconds, then the pause mode is assumed.

MAINTENANCE

Stylus
Before playing a record, clean the stylus with a soft brush. Brush the stylus from back to front. Never attempt to clean the stylus with your finger tip. If a fluid stylus cleaner is used, make sure not to moisten the stylus too much.



Cabinet
Clean the cabinet and dust cover periodically with a soft dry cloth. If the stains are difficult to remove, use a cloth moistened with a mild detergent solution. Do not use solvents such as alcohol, benzine or thinner, since they will damage the finish.

Rubber mat
When the rubber mat becomes dirty, wipe it gently with a soft cloth slightly dampened with water.

Lubrication
The turntable requires no periodic lubrication. The motor shaft is lubricated at the factory for the life of the turntable.

SPECIFICATIONS

Turntable

Platter	32 cm (12⅝ in.), aluminum-alloy diecast
Motor	Linear BSL (brushless and slotless) motor
Drive system	Direct drive
Control system	Quartz lock control, magnedisc servo control system
Speed	33⅓ rpm, 45 rpm
Starting characteristics	Comes to nominal speed within a half revolution (33⅓ rpm)
Wow and flutter	0.015 (WRMS)* 0.025% (WRMS) ±0.03% (DIN)
Signal-to-noise ratio	78 dB (DIN-B)
Load characteristics	0% up to 150 g stylus force (at lead-in groove of a record)
Speed deviation	Within ±0.003%
Automatic system	Lead-in, return, reject, repeat, record size selection, anti-skating

Tonearm

Type	Electronic tonearm
Pivot-to-stylus length	216.5 mm (8⅝ in.)
Overall arm length	295 mm (11⅝ in.)
Overhang	16.5 mm (21/32 in.)
Tracking error	+3°, −1°
Stylus force adjustment range	0 - 3 g
Cartridge shell weight	5 g
Cartridge weight range (including supplied cartridge shell)	7.5 - 12.5 g 12 - 17 g (with extra weight)

General

Power requirements	Type 1: 220 V ac Type 2: 240 V ac Type 3: 110-120 or 220-240 V ac adjustable 50/60 Hz
Power consumption	16 W
Dimensions	Approx. 430 × 120 × 385 mm (w/h/d) (17 × 4¾ × 15¼ in.) including projecting parts and controls
Weight	Approx. 8.5 kg (18 lbs 12 oz), net Approx. 10 kg (22 lbs 1 oz), in shipping carton
Supplied accessories	45-rpm adaptor (1) Extra weight (1) Cartridge shell (1) Cartridge mounting screws (1 set) Tonearm drop-point adjustment key (1)

While the information given is correct at the time of printing, small production changes in the course of our company's policy of improvement through research and design might not necessarily be indicated in the specifications. We ask you to check with your appointed Sony dealer if clarification on any point is required.

Note
Appliance conforms with EEC Directive 76/889 regarding interference suppression.

* This new measuring method concerns only the turntable assembly, including the platter. It excludes wow and flutter caused by the tonearm, the cartridge, or the record. Measured by obtaining signal from magnetic pick-up head.

TROUBLE CHECKS

The following trouble checks will help you correct most common problems encountered with a turntable system. Should any problem persist after you have made these checks, consult your nearest Sony service facility.
Before proceeding with these trouble checks, first refer to the connections and the operating procedures on page 7.

TROUBLES	CAUSES	WHAT TO DO
The tonearm does not lower on the record but returns to the arm rest.	Transparent record Warped record	Play the record manually.
The tonearm always lowers on the point for 30 cm records.	A rubber mat other than the one supplied being used.	Use the supplied rubber mat.
	Incorrect placement of the supplied rubber mat	Align the holes on the rubber mat with the holes of the platter.
The turntable does not rotate by pressing the START/STOP button.	The ZERO BALANCE switch is pushed in.	Press the switch again to lease it.
By pressing the START/STOP button, the turntable rotates but the tonearm does not move in.	The STYLUS FORCE/ANTI SKATING control is set to "0".	Set the control according to the stylus force of the cartridge used.
Impaired tone quality	Improper tonearm balance or tracking-force	Adjust the tonearm, referring to page 6.
	Dusty stylus	Clean the stylus with a soft brush from back to front.
	Worn stylus	The stylus life is approx. 400 hours. Replace with a new stylus.
Auto return does not operate at the end of play.	A record with shallow return grooves being played by a cartridge with low tracking force	Apply more tracking-force.
No audio from one channel	Loose connection of phono cord	Connect the cord firmly.
Steady low-pitched humming sound	Loose attachment of the cartridge shell to the tonearm.	Fix the shell to the tonearm firmly.
	Ground wire is not connected to the amplifier.	Connect the ground wire to the amplifier.
Groove skipping ; tonearm skating ; tonearm not advancing.	Improper tracking-force	Apply proper stylus force. (See page 6.)
	Turntable not level	Place the turntable on a level surface.
	Defective record	
Loud rumble or low-frequency howl *	The turntable subjects to external vibration.	Place the turntable on a solid surface free from external vibration.
	The turntable is placed too near the speaker.	Locate the turntable as far away from the speaker as possible.

* This is called "acoustic feedback" and is caused when vibrations from the speakers are transmitted through the air or via solid objects (such as the shelves, the cabinet, the floor, etc.) to the turntable, where it is picked up by the stylus, amplified and reproduced through the speakers once again.